

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application of: Bisgaard-Frantzen et al.

Confirmation No: TBA

Serial No.: TBA

Group Art Unit: TBA

Filed: December 19, 2001

Examiner: TBA

For: Amylase Variants

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, DC 20231

Sir:

Before examination, please amend the above-identified application as follows:

**IN THE CLAIMS:**

Please cancel claims 1-29 without prejudice or disclaimer.

Please add new claims 30-47:

30. A variant of a parent alpha-amylase enzyme, wherein said parent alpha-amylase has an amino acid sequence which has at least 80% homology to SEQ ID NO:3, and wherein said variant comprises deletions at positions equivalent to positions 179 and 180 in SEQ ID NO:3 (using SEQ ID NO:3 for numbering).

31. The variant of claim 30, wherein said parent alpha-amylase has an amino acid sequence which has at least 85% homology to SEQ ID NO:3.

32. The variant of claim 30, wherein said parent alpha-amylase has an amino acid sequence which has at least 90% homology to SEQ ID NO:3.

33. The variant of claim 30, wherein said parent alpha-amylase has an amino acid sequence which has at least 95% homology to SEQ ID NO:3.

34. The variant of claim 30, wherein said variant further comprises amino acid substitutions of a cysteine at positions equivalent to positions 349 and 428 in SEQ ID NO:3.

35. An isolated alpha-amylase enzyme comprising an amino acid sequence having an amino acid sequence which has at least 80% homology to SEQ ID NO:3, modified by having deletions at positions equivalent to positions 179 and 180 in SEQ ID NO:3.

36. The alpha-amylase enzyme of claim 35, wherein said alpha-amylase enzyme is further modified by having amino acid substitutions of a cysteine at positions equivalent to 349 and 428 in SEQ ID NO:3.

37. The alpha-amylase of claim 35, wherein said alpha-amylase has an amino acid sequence which has at least 85% homology to SEQ ID NO:3.

38. The alpha-amylase of claim 35, wherein said alpha-amylase has an amino acid sequence which has at least 90% homology to SEQ ID NO:3.

39. The alpha-amylase of claim 35, wherein said alpha-amylase has an amino acid sequence which has at least 95% homology to SEQ ID NO:3.

40. A process for producing an alpha-amylase enzyme, said process comprising:  
a) cultivating a host cell having a nucleic acid sequence encoding an alpha-amylase enzyme, said alpha-amylase enzyme comprising an amino acid sequence having at least 80% homology to SEQ ID NO:3 and wherein said alpha-amylase enzyme is modified by having deletions at positions equivalent to positions 179 and 180 in SEQ ID NO:3, wherein said cultivating is performed under conditions conducive to produce the alpha-amylase enzyme, and  
b) recovering the alpha-amylase from the culture.

41. The process of claim 40, wherein said alpha-amylase enzyme is further modified by having amino acid substitutions of a cysteine at positions equivalent to positions 349 and 428 in SEQ ID NO:3.

42. A DNA construct having a DNA sequence encoding an alpha-amylase enzyme comprising an amino acid sequence of SEQ ID NO:3 and further comprising deletions at positions equivalent to positions 179 and 180 in SEQ ID NO:3.
43. The DNA construct of claim 42, wherein said alpha-amylase enzyme further comprises amino acid substitutions of a cysteine at positions equivalent to positions 349 and 428 in SEQ ID NO:3.
44. A recombinant expression vector carrying the DNA construct of claim 42.
45. A cell transformed with the DNA construct of claim 42.
46. A cell transformed with the recombination expression vector of claim 44.
47. A process of producing an alpha-amylase, said process comprising culturing the cell of claim 45 under conditions conducive for the production of the alpha-amylase and recovering the alpha-amylase from the culture.

#### REMARKS

In this preliminary amendment, claims 1-29 are canceled and new claims 30-47 are added. Claims 30-47 are supported by the specification and claims as originally filed, including, *inter alia*, at page 13, lines 22-28 and page 16, lines 5-20 (describing deletions at positions specified in the claims) and page 15, line 9 to line 25 (describing substitutions of a cysteine at positions equivalent to positions 349 and 428 in SEQ ID NO:3), and page 25, line 17 to page 28, line 13 (describing processes for making the alpha-amylase enzymes of the present invention, DNA constructs having DNA sequences encoding the alpha-amylase enzyme of the present invention, recombinant expression vectors carrying DNA constructs having DNA sequences encoding the alpha-amylase enzyme of the present invention, and cells transformed with the recombinant expression vectors and DNA constructs of the present invention). There is no new matter added, and entry of the amendment is therefore respectfully requested.

Applicants enclose herewith the Sequence Listing for the above-captioned application. The computer-readable form in this application is identical with that filed in Application Serial No. 08/600,656, filed on February 13, 1996. In accordance with 37 CFR 1.821(e), please use the last filed computer readable form filed in that application as the computer readable form for the instant

application. It is understood that the Patent and Trademark Office will make the necessary change in application number and filing date for the computer readable form that will be used for the instant application. The content of the attached paper entitled "SEQUENCE LISTING" and of the computer readable form filed in the parent application is the same. No new matter is added.

The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

Respectfully submitted,

Date: December 19, 2001



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